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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,758	01/16/2002	Bharath Rangarajan	F0597	9689

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EXAMINER	
CURTIS, CRAIG	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/050,758	RANGARAJAN ET AL.	
	Examiner	Art Unit	
	Craig H. Curtis	2872	

-- The MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 7-10, 14, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirosawa (6,151,116).

With regard to independent claim 1, Hirosawa discloses the invention as claimed--[a] system (see Figs. 1 & 2) for measuring characteristics of a substrate (substrate 9), comprising:

a positioning system (see stage 10 in Figs. 1 & 2) having a support operative to receive a substrate (Id.), the positioning system being operative to rotate the substrate supported thereby about an axis extending through the support and the substrate (see Fig. 2; also see col. 6, ll. 21-42);

a measurement system (4-8 in Fig. 1) having a source operative to emit an incident beam onto the substrate (viz., infrared source W described by Hirosawa at col. 5, ll. 55-58); and

a control system (viz., computer 14: col. 6, ll. 47-50) operable to control the source to selectively emit the incident beam on an angular orientation of the substrate such that the incident beam selectively interrogates a region of the substrate near the axis (see above, esp. Fig. 1).

With regard to claim 2, the light source disclosed by Hirosawa is inherently operative to emit a light beam.

With regard to claim 3, the measurement system disclosed by Hirosawa further comprises a spectrometer (viz., spectrometer 4) operative to detect (in cooperation, of course, with detector 8) at least one of reflected and diffracted light in response to interaction of the incident beam with the substrate, the spectrometer providing a detector signal indicative of optical properties of the at least one of reflected and diffracted light (col. 5, ll. 64-67--col. 6, ll. 1-9).

With regard to claim 4, Hirosawa implicitly and/or inherently, if not indeed explicitly, discloses wherein at least one of the measurement system and the control system determin[es] substrate characteristics based on the detector signal.

With regard to claim 7, the light source of the measurement system disclosed by Hirosawa is inherently activated/controlled in synchronization with the rotation of the support so as to selectively interrogate said substrate when at a desired orientation relative to the light source (a limitation that is met even if light source is continuously on).

With regard to claim 8, please see detector 8.

With regard to claim 9, please see spectrometer 4.

With regard to claim 10, please above; also see 14 in Fig. 1 (esp. the interfacing of 14 with, inter alia, spectrometer 4, stage 10, and detector 8).

With regard to claim 14, Hirosawa discloses, as set forth above, the following:

means for rotating a substrate within a processing environment ("processing environment" being interpreted broadly but reasonably; after all, one could reasonably characterize the rotation of said substrate as a process) about an axis (see stage 10);

means for emitting (i.e., W in spectrometer 4) an incident light beam onto the substrate near the axis (see above);

means for detecting at least one of reflected and diffracted light in response to interaction of the incident light beam and the substrate (reflected light in this case; see detector 8); and

means for controlling the means for emitting to intermittently emit the incident light beam onto the substrate near the axis based on the angular orientation of the substrate relative to the means for emitting (see col. 8, ll. 63-67; again, even if means for emitting were continuously activated, the fact that Hirosawa teaches that measurements are occasionally taken at intervals of 60^0 (read: once every 60^0 of rotation) can be viewed as meeting Applicants' intermittent emission limitation recited in this claim, since a finite time interval will necessarily elapse as the substrate 9 in Hirosawa rotates 60^0 between measurement intervals, meaning that light emitted between said intervals from said means for emitting can reasonably be viewed as having been emitted intermittently).

With regard to claims 17-19, please see above.

With regard to claim 20, it is noted that the scatterometry technique recited by Applicants in this claim is synonymous, in a "term of art" sense, with the ellipsometric technique disclosed by Hirosawa, it being noted further that reflection is, phenomenologically speaking, a scattering process.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 5, 6, 11-13, 15, 16, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirosawa (6,151,116) in view of Temple et al. (4,592,939).

Hirosawa discloses the claimed invention as set forth above **EXCEPT FOR** explicit teachings of the following additionally recited limitations, wherein: said system further comprises a process system operatively coupled with said control system operative to at least one of apply material onto and remove materials from said substrate during an associated fabrication process, which is monitored by the measurement system; said substrate has at least one of features and gratings near the central region of the substrate; and said method further comprises at least one of applying and removing materials relative to said substrate during a fabrication process, and adjusting operating parameters associated with at least one of the rotating, the at least one of applying and removing, and the emitting based on the determined substrate characteristics. Hirosawa does however disclose wherein a substrate (e.g., sample C) is subjected to a rubbing process (which, arguendo, qualifies as a removal of materials). See col. 7, ll. 20-37.

Temple et al., however, explicitly disclose both a method and, by extension, a system operative to apply material (b) onto a substrate (d) during an associated fabrication process (col. 8, ll. 24-38), said material constituting features on said substrate near a rotational axis (Id.; also see Figs. 3-5 in Temple et al.) of same. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the system and method teachings of Hirosawa such that its system and method further comprise the application of a material onto a substrate, said material further constituting features on said substrate near a rotational axis thereof, such application being monitored by a measurement system, as explicitly disclosed by Temple et al., for at least the purpose of thereby protecting the surface of said substrate from damage via environmental degradation or other means.

Contact Information

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (703) 305-0776. The centralized facsimile phone number for the USPTO is (703) 872-9306.

Any inquiry of a general nature regarding the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

C.H.C.
Craig H. Curtis
Group Art Unit 2872
14 October 2003

Audrey Chang
Primary Examiner
Technology Center 2800